Determining the potential effects of oxidized fish oils in pregnant women requires a more systematic approach

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TO THE EDITOR: We read with interest the recent article from Albert et al. (1) concerning the effects of fish oil supplementation during pregnancy on rat offspring. The experimental design, however, lacks relevance to real-world conditions, and the results may unintentionally stimulate a public health crisis if women stop consuming eicosapentaenoic acid (EPA)/docosahexaenoic acid (DHA), important nutrients in pregnancy with demonstrated benefits of reducing early preterm birth risk (3).

The oxidized oil used in the study is not representative of fish oils sold in retail outlets. Retail products are typically sold in containers protecting the product from light and oxygen, are usually encapsulated and/or blanketed with nitrogen, and include a suitable antioxidant. In the present study, oxygen was bubbled through oil for 30 days under fluorescent light with no added antioxidant. The induced oxidation was severe enough to raise the peroxide value nearly 10-fold over maximum limits established by industry. A steady-state peroxide value of this magnitude over 30 days is extreme.

The authors observed statistically nonsignificant reductions in levels of nearly all fatty acids, suggesting the involvement of all lipid components of the oil being oxidized or polymerized due to an extremely severe level of oxidation. Characterizing potentially harmful oxidation products (such as oligomers, isomerized fatty acids, and oxysterols) formed under the employed artificial oxidation conditions is warranted before assigning toxic effects to oxidation products derived from EPA/DHA or fish oils in general. Furthermore, the study lacked an oxidized oil devoid of omega-3 long-chain polyunsaturated fatty acids (LCPUFA) to control for contribution of oxidized products derived from other lipids with demonstrated reproductive toxicity (2).

While we applaud the investigators for clarifying that the results cannot be extrapolated directly to humans, had the investigators been trying to determine whether consumption of oxidized fish oil during pregnancy was deleterious to offspring, we would have expected dose-ranging studies with a relevant oxidized oil to be conducted, following an internationally recognized toxicology testing method.

To conclude, we agree with Albert et al. that research is needed on potential effects of oxidized fish oils in pregnant women, but the research should follow established toxicology protocols and focus on the effects of relevant oxidation levels to put any risk to consumers in proper context.

DISCLOSURES

H. Rice, G. Bannenberg, and A. Ismail are employees of the Global Organization for EPA and DHA Omega-3s (GOED), a 501(c)6 not-for profit trade association. The goals of GOED are to increase consumption of omega-3s to adequate levels around the world and to ensure that the industry is producing quality omega-3 products that consumers can trust. M. Harwood is an employee of Neptune Wellness Solutions, a supplier of krill oil.

AUTHOR CONTRIBUTIONS

H. B. Rice, G. Bannenberg, M. Harwood, and A. Ismail drafted manuscript; H. B. Rice, G. Bannenberg, M. Harwood, and A. Ismail edited and revised manuscript; H. B. Rice, G. Bannenberg, M. Harwood, and A. Ismail approved final version of manuscript.

REFERENCES

